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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/650,556

08/28/2003

Rongguang Liang

86650NAB

7603

7590

08/24/2004

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EXAMINER

SEVER, ANDREW T

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/650,556

Applicant(s)

LIANG ET AL.

Examiner

Andrew T Sever

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/29/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 6-13 and 17-19 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-5, 14 and 15 is/are allowed.
- 6) ☒ Claim(s) 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/28/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of Species I (claims 1-5 and 14-16) in the reply filed on 7/29/2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 6-13 and 17-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/29/2004.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: projecting a right intermediate image, and forming a virtual image, among other things.

It appears that claim 16 should have properly been dependent on claim 14 as claim 15 is, since claim 16 alone has questionable functionality. Autostereoscopic

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images always have a right and left image, claim 16 lack the steps for producing a right image.

An attempt was made to contact applicant's representative on 8/19/2004 by telephone to authorize the office to correct the claim by examiner's amendment, however no response was given in a timely manner. Accordingly claim 16 stands rejected under 35 USC 112 second paragraph. For purposes of a prior art rejection, claim 16 will be read as comprising of the corresponding right image generating system as well, however it will not be read in light of claim 14, since it is not completely clear if this was applicant's intention.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Kessler et al. (US 6,416,181.)

Kessler et al. teaches in figure 1 an apparatus for displaying an autostereoscopic virtual image. Kessler further teaches a method using this apparatus for displaying an autostereoscopic (or stereoscopic) image (see claim 96 of Kessler). Kessler's method for displaying an autostereoscopic virtual image comprises of the steps of projecting a real

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image of curved left (right) intermediate image through a left ball lens segment (30R) comprising the step of projecting the real image through a hemispheric lens (ball lens segment (30 R) and a reflective surface (24).

Kessler does not specifically teach that the ball lens segment (30R) is a hemispheric lens segment, however those with ordinary skill in the art at the time the invention was made would recognize that a ball lens (of the type taught by Kessler in figure 3) is made of two hemispheric lenses and therefore Kessler teaches the light passing through a plurality of hemispheric lenses.

*Allowable Subject Matter*

7. Claims 1-5 and 14-15 are allowed.
8. The following is an examiner's statement of reasons for allowance:

Independent claims 1 and 14 claim an autostereoscopic optical apparatus and the method for using said apparatus to display an autostereoscopic virtual image respectively. The apparatus among other things comprises of left and right ball lens, first and second curved mirrors, and first through third beam splitters. The apparatus and method is for viewing by two viewers who view the image through separate beamsplitters.

All of these components combined were not found in the prior art and accordingly claims 1 and 14 are allowable. It is common in autostereoscopic optical systems to employ at least one beam splitter in both systems that viewed by a single

viewer and multiple viewers as shown in figure 11 of US 5,726,800 to Ezra et al. and figure 19 of US 6,014,164 to Woodgate et al., however neither of these teach the use of a curved mirror to generate 3D effect. Woodgate further teaches in another embodiment shown in figure 22, and Westort et al. (US 6,612,701) teaches in figure 1 optical systems which generate 3D images using curved mirrors and beamsplitters, however they do not teach the viewers viewing the image through separate beamsplitters (Woodgate uses a well known lenticular lens systems shown in figure 6, which is different then the claimed invention.) Further Westort, Woodgate, and Ezra do not teach the use of ball lenses. US 6,702,442 and US 6,768,585 both to Agostinelli et al, which are co-owned with the present application both teach and claim autostereoscopic systems having ball lenses, curved mirrors, and at least a single beamsplitter, however neither patent teaches or claims multiple viewers viewing through separate beamsplitters. US 5,189,452 to Hodson et al. teaches in figure 3 a real image projection system for multiple viewers which does teach each viewer viewing through their own separate beamsplitter, however, each beamsplitter is provided with a separate image source instead of a common image source as in the current application's claims 1 and 14 (although applicant claims two ball lenses by which the image is generated they combine to produce one stereoscopic image; an image for each eye. Hodson differs from the claimed invention in that a single real image is formed for both eyes specific to each beam splitter (i.e. the image viewed by one viewer is not necessarily the same as that viewed by the second viewer.)

It would not be obvious to combine any of the above prior art to obtain the present claimed invention since the only motivation would be hindsight. Accordingly claims 1

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and 14 are allowed. Claims 2-5 and 15 are dependent on claims 1 and 14 and are therefore also allowed. All claims are allowed.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 6,144,476 to Tanijiri et al. teaches in figure 1B a display device, which uses a curved mirror to generate a virtual image, and also teaches a beam splitter (5).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**JUDY NGUYEN  
PRIMARY EXAMINER**